OREGON COASTAL NONPOINT PROGRAM
NOAA/EPA PROPOSED FINDING
Draft 9/23/14

C. ADDITIONAL MANAGEMENT MEASURES - FORESTRY

PURPOSE OF MANAGEMENT MEASURE: The purpose of this management measures is to identify additional management measures necessary to achieve and maintain applicable water quality standards and protect designated uses for land uses where the 6217(g) management measures are already being implemented under existing nonpoint source programs but water quality is still impaired due to identified nonpoint sources.

CONDITION FROM JANUARY 1998 FINDINGS: Within two years, Oregon will identify and begin applying additional management measures where water quality impairments and degradation of beneficial uses attributable to forestry exist despite implementation of the 6217(g) measures.

PROPOSED FINDING:
(This finding is for all the additional management measures for forestry, not just pesticides. I'm leaving this blank.)

RATIONALE:
The federal agencies' January 13, 1998, conditional approval findings noted that Oregon had published forest practices rules that require buffer zones for most pesticide applications (OAR 629-620-0400(7)(b)). However, these rule changes did not address aerial application of herbicides on non-fish bearing streams. Aerial application of herbicides, such as glyphosate, 2,4-D, atrazine, and others, is a common practice in the forestry industry. Herbicides are sprayed to control weeds on recently harvested parcels to prevent competition with newly planted tree saplings. In the coastal nonpoint management area, non-fish bearing streams comprise 60-70% of the total stream length. Oregon does not require riparian buffers for forest harvests on non-fish bearing streams. Therefore, trees can be harvested up to the stream banks along non-fish bearing streams. Herbicides applied aerially can be delivered directly into these streams which may then enter fish-bearing streams or drinking water supplies.

EPA's January 1993 CZARA guidance describes its 6217(g) management measures for forestry (EPA-840-B-92-002, 1993) which includes the need to control forest chemicals. The guidance notes that herbicides, insecticides, and fungicides (collectively termed pesticides) applied directly or aerially are most easily transported to surface water and groundwater (Norris and Moore, 1971), and that pesticides with high solubilities can be extremely harmful to aquatic organisms (Brown, 1974). As a result, the guidance calls for a forest chemical management management measure where the State will

"Use chemicals when necessary for forest management in accordance with the following

to reduce nonpoint source pollution impacts due to the movement of forest chemicals off-site during and after application: (4) Establish and identify buffer areas for surface waters. (This is especially important for aerial applications.)"

The guidance states that the delivery of pesticides to surface waters from forestry varies depending on the type of application, presence or absence of buffers, and pesticide characteristics. Norris and Moore (1971) noted application of 2,4-D was one to two orders of magnitude higher in forestry operations without buffers than in areas with buffers. Fredriksen and others noted that in eight years of monitoring northwest forest streams, no herbicide residues were detected in water column one month after application. However, aquatic organisms and sediments were not sampled. Herbicide-induced changes in vegetation density and composition may cause indirect effects on streams such as increases in temperature or nutrients after riparian vegetation is eliminated. Fredriksen noted that unsprayed buffer strips should minimize these effects (Fredriksen et al., 1973). The guidance cites other studies that describe the benefits of buffers for aerial application of pesticides (Norris et al, 1991; Norris 1967). Botkin noted that in western Oregon and northern California, pesticides and fertilizers are applied at frequencies that indicate a potential for concern, and that fish are sensitive to some artificial chemicals (Botkin, 1994). Lastly, NMFS' biological opinion on 2,4-D and other herbicides note studies that describe potential harmful effects from herbicides on salmon health and habitat (NMFS, 2011).

Since its 1998 conditional approval findings, Oregon has provided several documents describing the programs it relies on to manage pesticides, most recently in March 2014. In addition to the FPA rule buffers noted above, the state also addresses pesticide issues through the Chemical and Other Petroleum Product Rules (OAR 629-620-0000 through 800), Pesticide Control Law (ORS 634), best management practices set by the ODA, and federal pesticide label requirements under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as well as its voluntary Water Quality Pesticide Management Plan and the state's Pesticide Stewardship Partnership. In its March 2014 submittal, Oregon noted that it specifically relies on best management practices set by ODA and EPA under FIFRA for the protection of small non-fish bearing streams.

NMFS completed biological opinions for herbicides in Washington and Oregon and assessed risks to ESA-listed Pacific salmon and steelhead. These biological opinions determined that streamside buffers were not necessary for the herbicides that were evaluated. There are currently three herbicides that have court-ordered buffers in place. The biological opinions and court-ordered buffers are not required to be and are not currently included in FIFRA labels.

As the result of several pesticide-related lawsuits regarding how federal agencies evaluate the impacts of pesticides on ESA-listed species and establish label requirements, EPA, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture requested the National Academies of Science to review existing methods for assessing pesticide risk to listed species and to recommend improvements to the risk assessment process. **Ex. 5 - Deliberative**

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative (ESA, (BEST), (DELS), & Council, 2013)

There have been no peer-reviewed studies to date that evaluate the extent and effects of aerial application of herbicides on non-fish bearing streams in the coastal nonpoint management area. Compared to neighboring coastal states and jurisdictions, Oregon has the smallest forestry-specific water resource buffers for herbicides. For smaller non-fish bearing streams, Washington maintains a 50-foot buffer (WAC-222-38-040). Idaho has riparian and spray buffers for non-fish bearing streams of 100 feet (IAR 20-02-01). California has riparian buffers for non-fish bearing streams ( ), which implicitly limit the herbicide use since herbicides would eliminate vegetation. Bureau of Land Management (BLM) lands in Oregon require that "no herbicide treatments should occur within 100 feet of a well or 200 feet of a spring or known diversion used as a domestic water source unless a written waiver is granted by the user of owner" (http://www.blm.gov/or/plans/vegtreatmentseis/files/Veg_Treatments_ROD_Oct2010.pdf). For drift control, Oregon has guidance for considering temperature, relative humidity, wind speed and direction for drift control. However, Washington, California, and BLM have prescriptive technology and weather-related best management practices to address drift control (Peterson, 2011).

- JW agreed deleted.ifgon needsils added leted it.ibiting any herbicides from entering into streams. ial application of herbic

In addition to its reliance on federal label requirements, Oregon has taken independent steps to further address pesticide water quality issues. In 2007, key state agencies, including ODA, ODF, ODEQ, and the Oregon Health Authority, worked together to develop an interagency Water Quality Pesticide Management Plan to guide State-wide and watershed-level actions to protect surface and groundwater from potential impacts of pesticides, including herbicides. The plan, approved by EPA Region 10 in 2011, focuses on using water quality monitoring data as the driver for adaptive management actions. The plan describes a continuum of management responses, ranging from voluntary to regulatory actions the state could take to address pesticide issues. If water quality concerns cannot be addressed through the collaborative, interagency-effort, regulatory actions are taken using existing agency authorities.

As outlined in the plan, the State's Pesticide Stewardship Partnership (PSP) Program is the primary mechanism for addressing pesticide water quality issues at the watershed level. Through the partnership, the ODEQ works with State and local partners to collect and analyze water samples and use the data to focus technical assistance and best management practices on streams and pesticides that pose a potential aquatic life or human health impact.

NOAA and EPA acknowledge the progress Oregon has made in its establishment of a multi-agency management team, development of its Water Quality Pesticide Management Plan, and implementation of its PSP Program. However, the federal agencies note that water quality monitoring data on pesticides is still limited in the State, and that Oregon has only established

eight PSP monitoring areas in seven watersheds, none of which are within the coastal nonpoint management area. While NOAA and EPA recognize that the PSP program is expanding into two new watersheds, the agencies believe that, if monitoring data are to drive adaptive management, the State should develop and maintain more robust and targeted studies of the effectiveness of its pesticide monitoring and best management practices within the coastal nonpoint management area. The federal agencies encourage the State to design its monitoring program in consultation with EPA and NMFS so that it generates data that are also useful for EPA pesticide registration reviews and NMFS biological opinions that assess the impact of EPA label requirements on listed species.

While the federal agencies are moving forward with a national solution with how risk assessments for pesticide label requirements are conducted, that does not preclude Oregon from taking action to establish buffers or buffer protections for aerial application of herbicides on Type N streams. Examples of ways the State could have an approvable program are through an enforceable or voluntary program with monitoring and tracking.

An example of an enforceable program would be to institute statewide spray buffers for aerial application of herbicides on Type N streams. Oregon could also institute riparian buffers on Type N streams, which by default would also provide a buffer for herbicides.

An example of a voluntary program with monitoring and tracking would be for the State to develop guidance and policies on voluntary buffers or on buffer protections for aerial application of herbicides on Type N streams. These could build on existing programs already in place with the addition of monitoring and tracking. Elements of the program could include the following:

- Guidelines for voluntary buffers or buffer protections for aerial application of herbicides on Type N streams.
- Outreach by ODA to aerial applicators of herbicides that focuses on minimizing aerial drift on Type N (non-fish bearing) streams and surrounding communities, including voluntary buffers;
- ODF notification to include a box indicating that aerial applicators must adhere to FIFRA labels for all stream types, including Type N streams;
- Monitoring the effectiveness of voluntary buffers on non-fish bearing streams in the coastal nonpoint management area for the aerial application of herbicides;
- Direct compliance monitoring efforts by ODA of FIFRA labels for aerial application of herbicides in forestry;
- Better mapping of Type N streams and other sensitive sites and structures; and
- Better use of maps and GPS to automatically shut off nozzles when crossing Type N streams.

REFERENCES:

National Marine Fisheries Service, Endangered Species Act Section 7 Consultation, Biological Opinion. Environmental Protection Agency Registration of Pesticides. 2.4-D, Triclopyr BEE, Diuron, Linuron, Captan, and Chlorothalonil.

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CONDITION FROM JANUARY 1998 FINDINGS: ~~Within two years, Oregon will finalize its proposal to inspect operating OSDS, as proposed on page 143 of its program submittal. (1998 Findings, Section IV.C).~~ Within two years, Oregon will identify and begin applying additional management measures where water quality impairments and degaradation of beneficial uses attributable to forestry exist despite implementation of the 6217(g) measures. ~~(1998 Findings, Section X.)~~

PROPOSED FINDING:
(This finding is for all the additional management measures for forestry, not just pesticides. I'm leaving this blank.)

Ex. 5 - Deliberative

RATIONALE:

Comment [AC1]: General comment: Is this intended to be the rationale or the briefing document. If briefing doc, you don't need to include all the specific rationale info. Just the pro/cons for the different options and a brief background on the issue. *- JW- this is the rationale document.*

Comment [CG2]: Where is our evidence that water quality is still impaired? It is not crystal clear in the discussion. -- *-JW I took this language from the December 2013 language, but looking at the original 1998 rationale, the reasoning is more complex. It speaks to fixing and maintaining water quality standards and identifies these specific areas as gaps that need to be addressed in order to protect aquatic species identified in the Coastal Salmon Restoration Plan which was intended to ID improvements to state programs to avoid listing coastal coho.*

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Comment [CJ3]: Please add the correct information. *Done - JW.*

Comment [AC4]: Need to remember that the condition is broader than just the pesticides issue. We're already disapproving them on this condition for other reasons. The question is: do we want to use pesticides as a basis for that disapproval? *- JW noted. I just wanted to put this in here for the non-CZARA tech team folks, so we could discuss what our options are even though the format of the additional forestry management measures will only have the rationale piece for the pesticides portion.*

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Comment [CJ5]: Does EPA and NOAA need to work through these issues before we can even consider removing our disapproval or can we remove our disapproval if Oregon adopts our ... [1]

Comment [JW6]:

Comment [AC7]: That's presumptive - *JW - changes made*

Comment [CJ8]: Not sure what this "target" means in this context. *-JW - can't find "target" so I may have deleted it.*

Ex. 5 - Deliberative

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Comment [AC10]: I don't think our option statement needs to include this. Options should be pretty short and sweet of managers can take it ... [3]

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~~that focuses oning~~
~~for herbicides~~
~~direct compliance monitoring efforts towardsaerial in forestry~~
~~b~~
~~of the timing of aerial application of herbicides to protect public health and inform Oregon whenof should be conducted~~
~~focuses on ing~~
~~for herbicides~~
~~direct compliance monitoring efforts towards aerial applicators in forestry;~~
~~b~~
~~public notification of the timing of aerial application of herbicides to protect public health and inform Oregon when monitoring of non-fish bearing streams should be conducted.~~
~~5) public notification to the State and communities to inform the timing for monitoring pre- and post-aerial application of herbicides in non-fish bearing streams.~~

~~*Buffers for Herbicide Application on Type N Streams*~~

The federal agencies' January 13, 1998, conditional approval findings noted that Oregon had published forest practices rules that require buffer zones for most pesticide applications (OAR 629-620-0400(7)(b)). However, these rule changes did not address aerial application of herbicides on non-fish bearing streams. Aerial application of herbicides, such as glyphosate, 2,4-D, atrazine, and others, is a common practice in the forestry industry. Herbicides are sprayed to control weeds on recently harvested parcels to prevent competition with newly planted tree saplings. In the coastal ~~zone~~ nonpoint management area, ~~however,~~ ~~n~~Non-fish bearing streams comprise 60-70% of the total stream length ~~within the coastal nonpoint management area~~. ~~These streams flow directly to fish-bearing streams and/or drinking water supply areas. In addition,~~ Oregon does not ~~there are no~~ required riparian buffers for forest harvests on non-fish bearing streams. Therefore, ~~, so in some areas,~~ trees can be harvested up to the stream banks along non-fish bearing streams. ~~, and h~~Herbicides applied aerially~~k. As a result, aerial application of herbicides on non-fish bearing streams~~ can be delivered directly into these streams which may ~~can~~ then ~~be transported downstream to~~enter fish-bearing streams or drinking water supplies~~, impacting designated uses such as drinking water and salmon habitat, including habitat for . where aquatic life can be harmed~~. ~~Oregon's coastal zone management area is home to endangered and threatened coastal coho and other salmonidsas well as many other salmonid and fish species.~~

~~Aerial application of herbicides, such as glyphosate, 2,4-D, atrazine and others, is a common practice in the forestry industry. Herbicides are sprayed to control weeds on recently harvested parcels to prevent competition with newly planted tree saplings.~~

~~: On December 20, 2013, EPA and NOAA invited public comment on the State's approach to buffers for aerial application of herbicides on Type N (non-fish bearing) streams. In the December 20, 2013 proposed action, the agencies noted Oregon had published forest practice rules that required buffer zones for most pesticide applications. The rules did not, however,~~

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Comment [CG11]: More specific? Need to add what will better mapping accomplish

Comment [AC12]: As I noted in my revised draft, these voluntary approaches would only be approvable if OR meets the "3-prong" test for voluntary programs. See suggested language that needs to be included to acknowledge those items are also needed before we can approve.

Comment [AC13]: As I noted in my revised draft, these voluntary approaches would only be approvable if OR meets the "3-prong" test for voluntary programs. See suggested language that needs to be included to acknowledge those items are also needed before we can approve.

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Comment [AC14]: Not sure these statements are needed at this place in the rationale. Too dupl … [6]

Comment [CG15]: I agree with Allison

Comment [AC16]: Is this correct. Is it used for other purposes too? - *JW - this is what I unde* … [7]

Comment [AC17]: Remember to always refer to it as the coastal NONPOINT management are … [8]

Comment [AC18]: More specific? - *JW added*

Comment [AC19]: Do we have better stats on percentage?? - *JW added*

Comment [AC20]: I'm assuming some Type N streams flow into other Type Ns so I don't thi … [9]

Comment [AC21]: For flow purposes, I like original language better here.

Comment [AC22]: I'm assuming even non-fish streams have "aquatic life"…just not in the … [10]

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Comment [AC23]: Is this correct. Is it used for other purposes too? - *JW - this is what I und* … [11]

~~contain restrictions for aerial application of herbicides on Type N streams, which the 1998 conditional approval findings and 2004 interim decision document and 2004 findings noted could leave those streams at risk. Type N streams comprise a significant portion of stream length in the coastal zone. Note that the term "pesticides" refers to insecticides, herbicides, fungicides, and various other substances used to control pests (U.S. EPA website). JW agreed deleted.ifgon needsils added leted it.ibiting any herbicides from entering into streams. ial application of herbic~~

EPA's January 1993 CZARA guidance describes its 6217(g) management measures for forestry (EPA-840-B-92-002, 1993) which includes the need to control forest chemicals. The guidance notes that herbicides, insecticides, and fungicides (collectively termed pesticides) applied directly or aerially are most easily transported to surface water and groundwater (Norris and Moore, 1971), and that pesticides with high solubilities can be extremely harmful to aquatic organisms (Brown, 1974). As a result, the guidance calls for a forest chemical management management measure where the State will

> *"Use chemicals when necessary for forest management in accordance with the following to reduce nonpoint source pollution impacts due to the movement of forest chemicals off-site during and after application: (4) Establish and identify buffer areas for surface waters. (This is especially important for aerial applications.)"*

The guidance states that the delivery of pesticides to surface waters from forestry varies depending on the type of application, presence or absence of buffers, and pesticide characteristics. Norris and Moore (1971) noted application of 2,4-D was one to two~~1-2~~ orders of magnitude higher in forestry operations without buffers than in areas with buffers. Fredriksen and others noted that in eight~~8~~ years of monitoring n~~N~~orthwest forest st~~e~~reams, no herbicide residues were detected in water column one~~1~~ month after application. However, aquatic organisms and sediments were not sampled. Herbicide-induced changes in vegetation density and composition may cause indirect effects on streams such as increases in temperature or nutrients after riparian vegetation is eliminated. ~~–~~Fredriksen noted that unsprayed buffer strips should minimize these effects (Fredriksen et al., 1973). The guidance cites other studies that describe the benefits of buffers for aerial application of pesticides (Norris et al, 1991; Norris 1967). Botkin noted that in we~~n~~stern Oregon and northern California, pesticides and fertilizers are applied at frequencies that indicate a potential for concern, and that fish are sensitive to some artificial chemicals (Botkin, 1994). Lastly, NMFS' biological opinion on 2,4-D and other herbicides note studies that describe potential harmful effects from herbicides on salmon health and habitat (NMFS, 2011).

Since its 1998 conditional approval findings, Oregon has provided several documents describing the programs it relies on to manage pesticides, most recently in March 2014. In addition to the FPA rule buffers noted above, the state also addresses pesticide issues through the Chemical and Other Petroleum Product Rules (OAR 629-620-0000 through 800), Pesticide Control Law (ORS 634), best management practices set by the ODA, and federal pesticide label requirements under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as well as its voluntary Water

Comment [AC24]: I think it may be getting too in the weeds and confusing to introduce the 2004 interim decision doc to the lay audience who's not familiar with the ins and outs of how we work with states on program devel. See my other version of how this could be revised (basically largely reverts back to original Dec. 20th language). *-JW- agreed*

Comment [AC25]: I don't think we need to rehash what we said on Dec. 20th. Just start with what we said in the Dec. 20th rationale and update that as needed. *- JW - agreed*

Comment [AC26]: I think the sci you present later on would be more impactful if it comes up front right after you introduce the condition and what OR has or doesn't have in place. Therefore, there is no questioning why OR needs to provide better protection of non-fish streams for airial spraying of herbicides. See potential edits in other version. *- JW - moved up, but consolidated study results. Could put detail back into rationale if you think it's better to be more detailed with the findings.*

Ex. 5 - Deliberative

Quality Pesticide Management Plan and the state's Pesticide Stewardship Partnership. In its March 2014 submittal, Oregon noted that it specifically relies on best management practices set by ODA and EPA under FIFRA for the protection of small non-fish bearing streams.

NMFS completed ~~its~~ biological opinions for herbicides in Washington and Oregon and assessed risks to ESA-listed Pacific salmon and steelhead. These biological opinions determined that streamside buffers were not necessary for the herbicides that were evaluated. There are currently three herbicides that have court-ordered buffers in place. The biological opinions and court-ordered buffers are not required to be and are not currently included in FIFRA labels.

As the result of several pesticide-related lawsuits regarding how federal agencies evaluate the impacts of pesticides on ESA-listed species and establish label requirements, EPA, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture requested the National Academies of Science to review existing methods for assessing pesticide risk to listed species and to recommend improvements to the risk assessment process. Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative As a result, the agencies are in the process of modifying the methods for risk assessment that may affect the future labeling requirements and best management practices for herbicide applications. (ESA, (BEST), (DELS), & Council, 2013)

Ex. 5 - Deliberative

~~*Unique Conditions in Oregon*~~

~~The forest landscape in Oregon requires more protection of Type N streams than FIFRA labels account for. When establishing the national label requirements for herbicides, EPA's Pesticides Program conducts risk assessments for each herbicide and herbicide. For aerial application, the current national risk assessment process generally assumes application occurs 10 feet above the ground over relatively flat land[1] (EPA, 1997)2. However, in Oregon, because the trees are tall, aerial application often occurs 70 to 80 feet above the ground over forestland and steep terrain.~~

~~[1]EPA Office of Pesticide Programs, Environmental Fate and Effects Division, December 10-11, 1997 Science Advisory Panel. Annual Spray Drift Review~~

~~2 EPA Office of Pesticide Programs, Environmental Fate and Effects Division, December 10-11, 1997 Science Advisory Panel. Annual Spray Drift Review.~~

Comment [AC28]: Use footnote citation. - *JW noted.*

Comment [AC29]: I don't think we need to cite this. This is the finding of our group (assuming we decide that OR isn't approved for this element).

Comment [AC30]: Don't use subheadings. This rationale will be part of a larger rationale for all add MMs for forestry. Like with the Dec. 20th proposed decision doc, the entire pesticides section will be under its own subheading.- *JW - okay. One of the subgroup memebrs suggested this to make the rationale clearer, but maybe in this cleaned up version, the text will read more logically.*

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Comment [CG31]: The term pesticide is an umbrella term that includes herbicides, insecticides, fungicides, rodenticides, etc. - *JW, my understanding is that this process holds for pesticides, not just herbicides. But since the action's focus is on herbicides, I'll change this to herbicides.*

Comment [AC32]: And how high is this? For clarititty, would be helpful to use the same reference point for each…X feet above the ground would make most sense.

Comment [AC33]: If you're using a footnote, do not need to include author/yr in text. That is only if using "lit cited" at the end.

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~~enabling the chemicals to more readily drift into adjacent waterways. In addition, the risk assessment process to determine FIFRA label requirements generally does not evaluate the specific impacts of the herbicide to salmon listed under the Endangered Species Act.~~

~~nonpoint management.~~

There have been no peer-reviewed studies to date that evaluate the extent and effects of aerial application of herbicides on non-fish bearing streams in the coastal nonpoint management area. Compared to neighboring coastal states and jurisdictions, Oregon has the smallest forestry-specific water resource buffers for herbicides. For smaller non-fish bearing streams, Washington maintains a 50-foot buffer (WAC-222-38-040~~http://www.dnr.wa.gov/Publications/fp_rules_ch222-38wac.pdf~~). Idaho has riparian and spray buffers for non-fish bearing streams of 100 feet (IAR 20-02-01). California has riparian buffers for non-fish bearing streams ( ), which implicitly limit the herbicide use since herbicides~~they~~ would eliminate vegetation. -Bureau of Land Management (BLM) lands in Oregon require that "no herbicide treatments should occur within 100 feet of a well or 200 feet of a spring or known diversion used as a domestic water source unless a written waiver is granted by the user of owner" (http://www.blm.gov/or/plans/vegtreatmentseis/files/Veg_Treatments_ROD_Oct2010.pdf). For drift control, Oregon has guidance for considering temperature, relative humidity, wind speed and direction for drift control. However, Washington, California, and BLM have prescriptive technology and weather-related best management practices to address drift control (Peterson, 2011).

~~*FIFRA Labels*Oregon's response noted several regulations the State uses to manage its pesticides program. Specific to small, non-fish bearing streams, Oregon's coastal nonpoint program relies on the Chemical and Other Petroleum Product Rules (OAR 629-620-0000 through 800), Pesticide Control Law (ORS 634), best management practices set by the ODA, and pesticide label requirements under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). For fungicides and nonbiological insecticides, Oregon requires that no spraying occur within 60 feet of a stream with flowing water at the time of application (OAR 629-620-0400(7)(b)). As noted above, however, the State does not have a buffer zone for aerial applications of herbicides?~~ - JW agreed deleted.ifgon needsils added leted it.ibiting any herbicides from entering into streams. ial application of herbic~~pesticides on non-fish bearing streams.~~

~~The Agencies received thirty-five comments related to the State's pesticide programs. Several commenters expressed concern on health effects to people and aquatic life from aerial drift of herbicides and the presence of herbicides in blood and urine samples. Others noted that better notification before pesticide application, access to pesticide records, monitoring, and larger buffers were needed. Commenters also supported the State's program stating that the labeling requirements under FIFRA and best management practices required when applying pesticides were adequate to protect people and aquatic species. Many commenters described studies of pesticide water quality data in the State, all noting that pesticide levels were detected. Some commenters concluded from these studies that pesticide levels were below thresholds of concern,~~

Comment [AC34]: Of what? Be specific of the types of herbicides

Comment [CG35]: Detections of herbicides?

Comment [AC36]: Use footnotes to include full citations like above.

Comment [AC37]: As stated, this isn't a strong argument for us. This is the point the industry/state keep on making to say…so, you may be able to detect it in waterways but its not at harmful levels so there's no reason to employ stricter requirements. Is there no better science out there we can point to that shows current application protracts are a problem? What about from the BiOps or all that stuff beyond toxics provided? If not we don't have a leg to stand on and I'd have to say we'd need to approve.

Comment [AC38]: Use correct citation format as above.

Ex. 5 - Deliberative

Comment [CG40]: I agree. Instead of this sentence, should we ask Oregon to map type ... [12]

Comment [WJ41]:

Comment [JW42]: Removed section on studies since none of them address aerial applicatio ... [13]

Comment [AC43]: Is this statement true for all neighboring states, including Idaho? If not, ... [14]

Comment [AC44]: We know this and will discuss it in the riparian section that comes l ... [15]

Comment [AC45]: Don't include link in text. Use footnote citation and include full citatio ... [16]

Comment [AC46]: See comment above about how to reference. - *JW -noted.*

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Comment [AC47]: Use footnote citation. - *JW noted*

Comment [CJ48]: Spell out. - *JW - section deleted.*

Comment [AC49]: I'm guessing we will have likely have introduced ODA earlier in the de ... [17]

Comment [CJ50]: Is this true for all pesticides (insecticides, herbicides, fungicides, and var ... [18]

Comment [JW51]: *Corrected - should be herbicides.*

~~while others concluded that the presence of pesticides showed that State regulations were insufficient to manage pesticides.~~

~~Because the State relies in large part on FIFRA labeling requirements for requirements on aerial application of herbicides around non-fish bearing streams, the following is a brief description of the program. EPA's Pesticide Program performs a comprehensive risk assessment that evaluates risk to workers, homeowners;, dietary risk; and drinking water risk; and non-target ecological risk. The pesticide risk assessment and registration process result in labeling requirements that vary. Examples of FIFRA label requirements on herbicide application range from prohibitions on aerial application to suggestions on how and where the application occurs (US Environmental Protection Agency, 2012) (U.S. Environmental Protection Agency, 1993).~~

Ex. 5 - Deliberative

In addition to its reliance on federal label requirements, Oregon has taken independent steps to further address pesticide water quality issues. In 2007, key state agencies, including ODA, ODF, ODEQ, and the Oregon Health Authority, worked together to develop an interagency Water Quality Pesticide Management Plan to guide State-wide and watershed-level actions to protect surface and groundwater from potential impacts of pesticides, including herbicides. The plan, approved by EPA Region 10 in 2011, focuses on using water quality monitoring data as the driver for adaptive management actions. The plan describes a continuum of management responses, ranging from voluntary to regulatory actions the state could take to address pesticide issues. If water quality concerns cannot be addressed through the collaborative, interagency-effort, regulatory actions are taken using existing agency authorities.

As outlined in the plan, the State's Pesticide Stewardship Partnership (PSP) Program is the primary mechanism for addressing pesticide water quality issues at the watershed level. Through the partnership, the ODEQ works with State and local partners to collect and analyze water

Comment [CJ52]: Do we want to include a summary of comments received in the rationales or just in the response to comments (and issue paper where appropriate) document? I recall a comment suggesting deleting this kind of information in another rationale. - *JW - deleted and will put this into response to comments*

Comment [AC53]: Agree. No need to repeat ourselves in two different documents. The Response to Comments will discuss all the comments received. The decision doc should only provide the rationale for our decision. *JW - agreed*

Comment [CJ54]: What does this mean? I understand ecological risk but not sure what "non-target" means in this context. - *JW section removed*

Comment [CJ55]: Both or which citation? -*JW section removed*

Comment [AC56]: I assume your citations are only temp. place holders and you plan to provide full citations later? To be consistent with how we cited sources in our proposed decision, we should use footnote citations that include full citation for each source. - *JW - yes, agreed. They're just placeholders for now. Will make consistent once we agree on the text.*

Comment [CJ57]: Explain why this is a problem in terms of water quality impacts etc.. - *JW section removed*

Comment [AC58]: Agree with Jayne's comment above. What does this mean to exposure to pesticides/herbicides or how easily they get into water? Make sure the connection between the science results you present and the points we want to support in our rationale is explicit. -*JW section removed*

Comment [AC59]: Use footnote citation. - *JW noted.*

samples and use the data to focus technical assistance and best management practices on streams and pesticides that pose a potential aquatic life or human health impact.

NOAA and EPA acknowledge the progress Oregon has made in its establishment of a multi-agency management team, development of its Water Quality Pesticide Management Plan, and implementation of its PSP Program. However, the federal agencies note that water quality monitoring data on pesticides is still limited in the State, and that Oregon has only established eight PSP monitoring areas in seven watersheds, none of which are within the coastal nonpoint management area. While NOAA and EPA recognize that the PSP program is expanding into two new watersheds, the agencies believe that, if monitoring data are to drive adaptive management, the State should develop and maintain more robust and targeted studies of the effectiveness of its pesticide monitoring and best management practices within the coastal nonpoint management area. The federal agencies encourage the State to design its monitoring program in consultation with EPA and NMFS so that it generates data that are also useful for EPA pesticide registration reviews and NMFS biological opinions that assess the impact of EPA label requirements on listed species.

Ex. 5 - Deliberative

~~Specific to ESA-related litigation filed in 2001, the Washington Toxics Coalition sued EPA for failing to consult with NOAA's National Marine Fisheries Sired EPA to initiate consultation with NMFS. EPA has since initiated consultation with NMFS on 37 pesticide active ingredients. NMFS has issued six final biological opinions (BiOps) for 29 active ingredients as well as a draft of the seventh BiOp for three remaining additional active ingredients. NMFS has not yet, however, issued BiOps for the five remaining active ingredients nor the seventh BiOp. In the BiOps that have been issued, NMFS concluded that some herbicides are likely to jeopardize some listed species. For these herbicides, NMFS included reasonable and prudent alternatives, such as including buffers around water bodies (f(Fish and non-fish bearing) during aerial[2] application. But some of the RPAs are restrictive for agricultural applicators and EPA and agricultural interests have explored alternative mitigation approaches that would provide protection to ESA species but would not be so restrictive on agricultural growers.~~

Comment [CJ60]: May want to apply directly to Oregon's coasts and note whether there are ESA listed species located on Oregon's coast and that could be impacted by herbicide applications -*JW included in first paragraph*

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Comment [CJ61]: Confusing citation - *JW - will clean up citation; used Word function to input entire citation, but this is what they came up with. Will edit later.*

Comment [CJ62]: Are any of these active ingredients for herbicides? - *JW, yes.*

Comment [AC63]: Acknowledge that original court-ordered buffers are still in place for these. - *JW section deleted*

Comment [AC64]: Specify which ones or at least examples of the more prevalent ones? - *JW section deleted, but if we decide we want to bring the section back, I can do that.*

Comment [AC65]: For both fish and non-fish bearing streams that directly flow into fish-bearing streams, correct? - *JW section deleted*

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~~In addition to ongoing work on EPA's pesticide risk assessment,~~ ~~several studies have evaluated studied effects from aerial drift of herbicides from forestry applications. In March 2000, ODF's study on aerial pesticide application monitoring in Oregon coastal areas measured trace levels of less than 1 part per billion (ppb) of herbicides in seven of 25 stream sites adjacent to post-spray applications (Dent & Robben, 2000). These levels were well below thresholds of concern established in the study for people, fish, and invertebrates. However, the study also noted that its focus was on water quality protection of streams with riparian buffer requirements, such as fish-bearing and domestic use streams, and did not address small non-fish bearing streams that do not have overstory riparian buffer requirements. In Oregon also described a USGS study in the McKenzie River of the Clackamas Basin, outside the coastal zone management area,. Of 175 compounds, 43 out of 175 compounds were detected at least once across 28 sites. The study focused on urban, forestry, and agricultural land uses. Nine pesticides were detected out of 14 samples from the drinking water facility's intake from 2002 to 2010. However, concentrations were low, less than 1 part per billion, and the largest number of pesticide detections were associated with urban stormwater (Kelly et al. 2012).~~

~~EPA evaluated non-fish bearing streams in the Highway 36 area in the midcoast of Oregon to look at the potential of herbicide transport downstream to fish-bearing streams. (Peter L. and Alan – talk with Friday.)~~

~~It is also important to note an ongoing Exposure Investigation (EI) for the Highway 36 Corridor in the mid-coast region of Oregon in the Coastal Zone Management Area (Oregon Health Authority, Draft Final, 2014). EPA and NOAA received several comments related to aerial application of herbicides in the Highway 36 Corridor. Conclusions from the ongoing Exposure Investigation (EI) for the Highway 36 Corridor in the mid-coast region of Oregon in the Coastal Zone Management AreaConclusions from the EI show that residents were exposed to herbicides during the investigation period, but it is not possible to confirm whether these exposures resulted from the aerial application of pesticides or from another source. Low levels of herbicides applied during aerial applications were found in 10 soil samples, but no herbicides were found in drinking water samples. EPA will be conducting air monitoring to determine the public health significance from aerial application of herbicides in the Highway 36 Corridor. (Oregon Health Authority, Draft Final, 2014).~~

While the federal agencies are moving forward with a national solution with how risk assessments for pesticide label requirements are conducted, that does not preclude Oregon from taking action to establish buffers or buffer protections for aerial application of herbicides on Type N streams. ~~ensure water quality and designated uses are protected in its own state from~~

Comment [CJ66]: Can you include a sentence that describes the relevance of these findings to the basis for our disapproval or how these informs our decision? - *JW section deleted*

Comment [CJ67]: At the end of your descriptions of these studies, can you explain the relevance of these studies to our disapproval decision or how these studies are being used to inform our decision? *JW section deleted*

Comment [CJ68]: Spell out *JW section deleted*

Comment [AC69]: Was it a specific herbicide or did they measure several different kinds? Even so, it would be handy to note which ones since toxicity varies based on the type of herbicide so helps put the 1ppb into context. *JW section deleted*

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Comment [AC70]: So what does this mean for the points we are trying to support in our rationale?? Be explicit about the connection to water quality, etc. Does it indicate that observed pesticide levels in these streams may be even greater after a spray event and exceed toxic thresholds? *JW section deleted. The last question is correct. Some commenters wanting disappoval of the program (and some other EPA ORD scientists) have noted that it's difficult to measure herbicides, and the study design may have been designed to answer a different question than what we're looking at. All in all, though, none of these studies are specific to our question, so I took out the text.*

Comment [AC71]: It's not clear to me how this study helps the points we want to make in our rationale….urban stormwater runoff is a bigger culprit of pesticides than forestry? Not sure that helps us? Either make the connection more explicit to the points we want to make or consider taking out. - *JW section deleted.*

Comment [AC72]: Is this Triangle Lake area or somewhere else? If Triangle, make be good to note that for those of us that may be less familiar with the Hwy 36 reference. But perhaps for Oregonians, this is all very clear? *JW - took out section as suggested by Linda and Gabriela. We'll stick to the main points in the rationale focusing on type N streams not human health exposure, but can address these in the response to comments.*

Comment [AC73]: Again, what do these results mean for the points we want to make in our rationale—that aerial spraying for herbicides under current no-buffer restrictions is bad for water quality/designated uses and OR needs better protections? *JW- section deleted*

~~aerial application of herbicides on Type N streams before the federal process is complete.~~ Examples of ways the State could have an approvable program are through an enforceable or voluntary program with monitoring and tracking.

An example of an enforceable program would be to institute statewide spray buffers for aerial application of herbicides on Type N streams. Oregon could also institute riparian buffers on Type N streams, which by default would also provide a buffer for herbicides.

An example of a voluntary program with monitoring and tracking would be for the State to develop guidance and policies on voluntary buffers or on buffer protections for aerial application of herbicides on Type N streams. These could build on existing programs already in place with the addition of monitoring and tracking. Elements of the program could include the following: ~~Option A: The agencies could approve the State's pesticide condition under forestry with the following: Option B: The federal agencies strongly recommend the State conduct the following:~~

- ~~Guidelines for voluntary buffers or buffer protections for aerial application of herbicides on Type N streams. Buffers on Type N streams for aerial application; or the following:~~
-
- Outreach by ODA to aerial applicators ~~-~~of herbicides that focuses on minimizing aerial drift on Type N (non-fish bearing) streams and surrounding communities, including voluntary buffers;
- ODF notification to include a box indicating that aerial applicators must adhere to FIFRA labels for all stream types, including Type N streams;
- Monitoring the effectiveness of voluntary buffers on non-fish bearing streams in the coastal nonpoint management area for the aerial application of herbicides;
  - ~~Application of pesticides as close to the crop canopy and at the slowest air speed that is safe for flight;~~
  - ~~Applications when wind speed is between 1-10 mph;~~
  - ~~Applications when wind is blowing away from sensitive sites or structures;~~
  - ~~Calibration of nozzles and repair of leaks;~~
  - ~~Correct nozzle selection, angle of release and placement on wingspan;~~
  - ~~Use of largest droplet size possible to ensure crop coverage;~~
  - ~~Use of drift reducing adjuvants;~~
  - ~~Use of spray shields;~~
  - ~~Evaluation of local meteorological conditions to evaluate most appropriate times of year, time of day or windows when weather patterns are conducive to effective aerial applications;~~
- ~~Monitoring non-fish bearing streams in the coastal nonpoint management area for herbicides pre- and post-application and coordinated with the federal agencies to determine appropriate location, frequency, and parameters;~~
- Direct compliance monitoring efforts by ODA of FIFRA labels ~~towards~~for aerial application of herbicides in forestry;
- Better mapping of Type N streams and other sensitive sites and structures; and

Comment [AC74]: As noted above, there could be an option C too. - *JW, as explained earlier, I think it would be hard for us to say that this program is approvable given our past determinations. Nothing has changed.*

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Comment [JW76]: Included the latter at the request of the pesticides team

Comment [AC77]: Since the PSP para. below talks about better monitoring protocols below, to avoid redundancies and jumping back and forth between discussion of OR's programs and what else they could do to get to full approval, recommend moving the discussion of all recommendations to the end.

Also, need to make sure you also include that if OR chooses a voluntary approach, need to meet the 3 – prong test (see lang. from the revised rationale I wrote). In addition, as long as we're providing recommendations, why not also recommend a rule change (it's a viable option for approval). Again, my rationale had some language that we could use for this.

- Better use of maps and GPS to automatically shut off nozzles when crossing Type N streams.

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REFERENCES:

National Marine Fisheries Service, Endangered Species Act Section 7 Consultation, Biological Opinion. Environmental Protection Agency Registration of Pesticides. 2.4-D, Triclopyr BEE, Diuron, Linuron, Captan, and Chlorothalonil.

~~At the State level, Oregon has taken independent steps to address pesticide water quality issues. Key State agencies, including ODA, ODF, ODEQ, and the Oregon Health Authority, formed a team in 2007 that developed an interagency Water Quality Pesticide Management Plan to guide State-wide and watershed-level actions to protect surface and groundwater from potential impacts of current pesticides. The plan, approved by EPA Region 10 in 2011, focuses on using water monitoring data as the driver for adaptive management actions. The plan includes a continuum of management responses, ranging from voluntary to regulatory actions. Regulatory actions are implemented using existing agency authorities, if the water quality concerns cannot be addressed through the collaborative team effort. The State's Pesticide Stewardship Partnership (PSP) Program is the primary mechanism for addressing pesticide water quality issues at the watershed level. Through the partnership, the ODEQ works with State and local partners to collect and analyze water samples and use the data to focus technical assistance and best management practices on streams and pesticides that pose a potential aquatic life or human health impact. The federal agencies acknowledge the process compliment Oregon has made for its establishment of a multi-agency management team, development of its Water Quality Pesticide Management Plan, and implementation of its PSP Program. If fully implemented, where needed, across the coastal nonpoint management area, these actions would represent strong management measures for helping the State address key pesticide issues.~~

~~EPA's and NOAA's original basis for disapproval was inadequate riparian buffers for aerial application of herbicides on non-fish bearing streams. In addition to non-fish bearing streams comprising a large part of coastal stream length, there are additional opportunities for herbicides to enter streams through runoff since non-fish bearing streams lack buffer requirements. Thus far, limited studies have shown low levels of pesticides below thresholds of concern. However, it is important to note that depending on pesticide label requirements and based on the toxicity of the pesticide, even detectable levels of pesticides may not be in adherence to FIFRA requirements, depending on the level of restrictions on aerial application of the product herbicides.~~

~~Aerial drift and their effects on aquatic life and people remain a concern. The federal agencies note that water quality monitoring data on pesticides are still limited in the State and that ODEQ has only established eight PSP areas in seven watersheds, none of which are located within the~~

Comment [AC78]: May want to tone down lang. a bit since several commenters took fault at EPA/NOAA for appearing to praise OR so highly for efforts that still need a lot of work and aren't even w/in coastal nps area. -*JW noted. I see that you changed "compliment" to "acknowledge" which works. Though we got comments from NWEA and others on this, I understand it really is a successful program for the State as far as voluntary efforts go, and it's a step in the right direction even if there are none in the coastal area. I think it's reasonable with your changed verb.*

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Comment [AC79]: Does that mean if OR fully implements we would approve this element of the add MMs for forestry condition? I know this is carry over lang from the Dec. proposed findings doc but we should be very clear what OR needs to do to get to approval for this issue. If we will accept "fully implementing the PSP, what does that mean? - *JW, I see either buffers or conditions described above as being grounds for an approvable program, though the devil's in the details.*

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Comment [AC80]: These points should be made earlier on. Also, I find the sentence: "Thus far, limited studies have shown low levels of pesticides below thresholds of concern" confusing. So are we saying few studies have observed pesticides levels below "safe" levels? Or are we commenting that there isn't a lot of research out there on pesticide levels after spray events? Need to make sure statement is supported with citations. - *JW section deleted*

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Comment [AC81]: I don't understand this? What are we trying to say here? *JW section deleted*

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coastal nonpoint management area. While the federal agencies recognize that the PSP program is expanding into two new watersheds, the agencies believe that, if monitoring data are to drive adaptive management, the State should develop and maintain more robust and targeted studies of the effectiveness of its pesticide monitoring and best management practices. These studies should include several sites within the coastal nonpoint management area. The federal agencies also encourage the State to design its monitoring program in consultation with EPA and NMFS so that it generates data that are also useful for EPA pesticide registration reviews and NOAA BiOps.

Comment [AC82]: This seems a bit disjointed. Talked about PSP above and a few para below return to it. Would be helpful to talk about all PSP info together. *JW- done*

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recommendations include:

- State specific buffers on non-fish bearing streams for aerial application of herbicides and pesticides such as the recommended buffers in the NMFS BiOps;
- Herbicide application guidelines for buffer and drift control such as reduced droplet size, consideration of terrain and weather conditions, better mapping of spray application area;
- Better, more timely, specific, and transparent, PpublicPublic notification processes for all citizens near spray areas, rather than justof bystanders, homes and businesses in close proximity to aerial applications, beyond community water managers prior to spraying;
- Better record keeping and transparency of public records;
- Increased training and guidance for applicators; and
- Increased effectiveness monitoring of pesticides and best management practices within the coastal nonpoint management area.

Better mapping of N-type streams and other sensitive sites and structures;

State specific aerial application guidelines for drift control of pesticides;

Annual applicator training, guidance and outreach for aerial applicators on how to reduce drift;

The application guidelines and aerial applicator training should address such things as:

Application of pesticides as close to the crop canopy and at the slowest air speed that is safe for flight;

Applications when wind speed is between 1-10 mph;

Applications when wind is blowing away from sensitive sites or structures;

Calibration of nozzles and repair of leaks;

Correct nozzle selection, angle of release and placement on wingspan;

Use of largest droplet size possible to ensure crop coverage;

Use of drift reducing adjuvants;

Use of spray shields;

Comment [AC84]: That's presumptive - *JW - elaborated on. Had only wanted a placeholder there for either "soft" or "hard" disapproval*

Comment [CJ85]: Not sure what this "target" means in this context. - *JW section deleted*

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Comment [CJ86]: If Oregon accepts all of our recommendations, will we remove our disapproval? If so, do they need to accept them all or are there key ones that need to be accepted in order to obtain our approval? *-JW Clarified later*

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Comment [AC87]: Why limit ourselves to just non-fish bearing here? BiOps have shown that larger buffers are needed elsewhere too. *- JW I wanted to stick with our original condition focused on non-fish bearing.*

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Comment [AC88]: So if OR does this, and meets the other elements of a voluntary program, would we approve this element? Need to be clear on what the bar is and how OR could reach it. Otherwise they have the right to complain that we are continuously moving it on them. *-JW - added info on the bar.*

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~~Evaluation of local meteorological conditions to evaluate most appropriate times of year, time of day or windows when weather patterns are conducive to effective aerial applications;~~

~~Use of maps and GPS to automatically shut off nozzles when crossing N-type streams and other sensitive sites;~~

~~Notification of bystanders, homes and businesses in close proximity to aerial applications.~~

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Page 1: [1] Comment [CJ5] **Carlin, Jayne** **8/14/2014 11:04:00 PM**

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Page 1: [2] Comment [AC9] **Allison Castellan** **8/15/2014 10:43:00 AM**

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Page 1: [3] Comment [AC10] **Allison Castellan** **8/18/2014 9:06:00 PM**

I don't think our option statement needs to include this. Options should be pretty short and sweet of managers can take in the essence quickly. We could reference a separate section of briefing document that lists potential recommended BMPs if we take this approach. - *JW - okay. This is the rationale document, so I've taken out until the end.*

Page 2: [4] Formatted **Carvalho, Gabriela** **8/18/2014 11:28:00 AM**

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Page 2: [5] Formatted **Carvalho, Gabriela** **8/18/2014 11:28:00 AM**

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Page 2: [6] Comment [AC14] **Allison Castellan** **8/18/2014 9:07:00 PM**

Not sure these statements are needed at this place in the rationale. Too duplicative of what is said below. - *JW - agreed - I removed them*

Page 2: [7] Comment [AC16] **Allison Castellan** **8/14/2014 11:04:00 PM**

Is this correct. Is it used for other purposes too? - *JW - this is what I understand. Others can check.*

Page 2: [8] Comment [AC17] **Allison Castellan** **8/18/2014 9:09:00 PM**

Remember to always refer to it as the coastal NONPOINT management area. OR's coastal zone boundary is different and we shouldn't confuse the two. - *JW - Will make sure this is consistent in rationale.*

Page 2: [9] Comment [AC20] **Allison Castellan** **8/15/2014 10:43:00 AM**

I'm assuming some Type N streams flow into other Type Ns so I don't think this is a correct statement. Revert back to "most" or "many" the more specific we can be, the better (i.e., do we have a percentage we could use?)

Page 2: [10] Comment [AC22] **Allison Castellan** **8/15/2014 10:43:00 AM**

I'm assuming even non-fish streams have "aquatic life"…just not in the form of fish.

Page 2: [11] Comment [AC23] **Allison Castellan** **8/14/2014 11:04:00 PM**

Is this correct. Is it used for other purposes too? - *JW - this is what I understand. Others can check.*

Page 5: [12] Comment [CG40] **Carvalho, Gabriela** **8/18/2014 12:16:00 PM**

I agree. Instead of this sentence, should we ask Oregon to map type N streams and monitor before and after an aerial application?

The text would say something like:

Page 5: [13] Comment [JW42] **Jenny Wu** **8/18/2014 9:23:00 PM**

Removed section on studies since none of them address aerial application of herbicides on non-fish bearing streams. The State and others cite these studies as proof supporting the position of both sides (approval or disapproval), because there is limited pesticides data. However, none of them actually attempt to study aerial application of

absence/presence/threshold of concern issues.

Page 5: [14] Comment [AC43] **Allison Castellan** **8/18/2014 9:17:00 PM**

Is this statement true for all neighboring states, including Idaho? If not, need to be specific on the state's you're referring to. - *Yes, it does. But I didn't include it since it's not a coastal state. I can just add on coastal state. CA was also included.*

Page 5: [15] Comment [AC44] **Allison Castellan** **8/18/2014 9:18:00 PM**

We know this and will discuss it in the riparian section that comes before, but what about buffers for aerial application of hercides for type N streams? That is the question for this element. -*JW - clarified this refers to herbicides.*

Page 5: [16] Comment [AC45] **Allison Castellan** **8/18/2014 9:20:00 PM**

Don't include link in text. Use footnote citation and include full citation. Do not rely only on link to pdf which can break. - *JW - I'll clean up the citations once the text is done. I have these as a placeholder, so I know where to get the references. I'll use the reference guide from above.*

Page 5: [17] Comment [AC49] **Allison Castellan** **8/14/2014 11:04:00 PM**

I'm guessing we will have likely have introduced ODA earlier in the decision rationale so it will be fine to abv here but when we put everything together we can make the final call of where we need to spell things out first and when its ok to use the acronym. - *JW agreed*

Page 5: [18] Comment [CJ50] **Carlin, Jayne** **8/14/2014 11:04:00 PM**

Is this true for all pesticides (insecticides, herbicides, fungicides, and various other substances used to control pests) or just herbicides?